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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/453,518 12/03/99 HADA

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EXAMINER

IM22/1108

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ART UNIT

PAPER NUMBER

1744

DATE MAILED:

11/08/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
09/453,518

Applicant(s)

Hada et al.

Examiner

Kaj Olsen

Group Art Unit

1744



☒ Responsive to communication(s) filed on Dec 3, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claim

☒ Claim(s) 1-13 is/are pending in the applicant

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-13 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some\* ☒ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2,3

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 5, the limitation requiring the conductor to shorten the weaker the signal is is indefinite because it is not positively reciting a structural limitation. The limitation is merely a stating of a concept of making conductors short and conveys no structural information. In addition the limitation of claim 1 requiring the conductor have a length which is "function of a level of the signal outputted" is indefinite because it is unclear what the metes and bound of the limitation are. Moreover, the signal outputted will vary depending on the gas content being

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measured. For example if there is more NO<sub>x</sub> contained within the gas, would a different length of cable be then desired?.

In claims 3 and 4, it is unclear if the applicant is positively reciting the presence of a "sensor element" of the sensor.

In claims 7, 9, and 11, the applicant's use of the phrase "has (having) a function of" is not clearly defining any structure which would be necessary for performing said function making it unclear if anything concerning said function is being claimed. The examiner recommends the applicant clearly structurally recite the function (e.g. function means for...).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-13 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over EP 849,591.

With respect to claims 1, 2, 5, and 13 as best understood, EP ('591) discloses a gas concentration measuring apparatus which comprises a sensor and a signal processing circuit (fig. 2, 4, 6). Said signal processing circuit is presumably located either adjacent or within the electronic control unit (ECU). Said electronic control unit would read on the applicants use of the term signal processing circuit. Moreover the result of circuit for controlling and measuring the sensor is either inherently (or would have been obvious to one possessing ordinary skill in the art) being utilized via some inherent connector to control other external devices such as the fuel injectors or warning systems for warning operators of a deteriorating NOx catalyst. Utilizing gas sensors for closed feedback control of the fuel injectors is conventional in the art. Furthermore a conductor must also be being utilized to connect said sensor to said signal processor to provide the various electrical connections to the sensor. Although the reference

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does not discuss choosing a particular length of conductor, it is unclear how said limitation drawn to the length is meant to be interpreted (see 112 rejection above) and said reference inherently teaches the use of some length of conductor. Alternatively, the concept of utilizing as little electrical conducting wire as possible is common sense requiring only routine skill in the art. Any conductors inherently possess some degree of line loss per unit length and minimizing said line loss by reducing cable length would have been obvious to one of ordinary skill in the art at the time the invention was being made.

With respect to claims 3, 4, and 6 as best understood, EP ('591) further teaches the use an impedance measuring circuit (col. 23, lines 13-42), a heater circuit (col. 19, lines 20-32), and has two cells which have voltage applied to them (col. 17, lines 47-58 and col. 20, lines 20-25) and each produce an electric current. Although EP ('591) never specifies measuring the current of the first cell, the claims never specify the current need be measured. With respect to claims 7-11 as best understood, it is not clear any element is being positively recited. Alternatively, it is well known to calibrate sensors (either at the factory or after installation in the application for the sensor) and a calibration of the sensor would appear to read on the "claimed" functions. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to calibrate the sensor to ensure the sensor is giving an accurate response. With respect to claim 12 (those limitations not covered above), EP ('591) does not explicitly identify placing the components of the heater impedance measuring and heater control circuit on a bare chip on a ceramic substrate. However, EP ('591) presumably utilizes conventional IC chip components

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(op-amps, etc), the use of any number of materials for the substrate, including ceramics, would appear to be conventional materials.

7. Claims 1-6 and 7-13 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over EP 120,423..

With respect to the claims as best understood, EP ('423) discloses a gas sensing apparatus which comprises a sensor element 100, a conductor 103, a signal processing circuit 104, and a connector 106 which connects the signal processor 104 to an external device 107. Although the reference does not discuss choosing a particular length of conductor, it is unclear how said limitation drawn to the length is meant to be interpreted (see 112 rejection above) and said reference inherently teaches the use of some length of conductor. Alternatively, the concept of utilizing as little electrical conducting wire as possible is common sense requiring only routine skill in the art. Any conductors inherently possess some degree of line loss per unit length and minimizing said line loss by reducing cable length would have been obvious to one of ordinary skill in the art at the time the invention was being made.

EP ('423) further discloses a heater and impedance measuring circuit 400 for heating the circuit and monitoring the impedance of a heater element of the sensor (paragraph bridging pp. 13 and 14). Furthermore the function of the various circuits within signal processor 104 is to compensate the various aspects of the sensor for unit-to-unit variation (see abstract). With respect to claim 12 (those limitations not covered above), EP ('423) does not explicitly identify placing the components of the heater impedance measuring and heater control circuit on a bare

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chip on a ceramic substrate. However, EP ('423) presumably utilizes conventional IC chip components (p. 14, line 12), the use of any number of materials for the substrate, including ceramics, would appear to be conventional materials.

8. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP ('591) in view of EP ('423).

EP ('591) discloses a gas sensing apparatus utilizing a sensor which reads on the claimed portions of the sensor (see 102 rejection above). Although EP ('591) read on the claimed invention, EP ('591) does not teach utilizing a signal processing circuit which is separate from an ECU unit. However, as discussed above for EP ('423), said reference teaches utilizing a separate signal processing unit 104 which allows a gas sensor characteristics to be compensated (i.e. calibrated) for individual sensors (see abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of EP ('423) for the sensor of EP ('591) so that the sensor of EP ('591) can be compensated for variations in sensor performance. Said sensor would ensure accurate measurement even if the sensor was not suitably factory calibrated, or even if the sensor has degraded since original installation.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nakajima et al.



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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (703) 305-0506.

If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Mr. Robert Warden, can be reached at (703) 308-2920.

When filing a fax in Group 1700, please indicate in the header "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communications with the PTO that are not for entry into the file of this application. This will expedite processing of your papers. The fax number for this Group is (703) 305-7719.

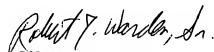
Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0661.

Kaj K. Olsen, Ph.D.



Patent Examiner

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